The apparatus is made to sterilise different units, the largest size being capable of dealing with 600 cubic metres in twenty-four hours. The diagram practically explains itself. L is the lamp, which is enclosed in a box with rock-crystal windows. The water to be sterilised, which must, if not clear, be previously filtered, passes in at R, and by means of baffling is caused to pass three times past the rays in the steriliser E. In case of the lamp going out, there is a valve S, electromagnetically operated, which opens, and immediately prevents the water from flowing through the sterilising chamber. This apparatus is used at Rouen, where the water for the suburb Maromme-les-Rouen is sterilised by three units. Several other cities in France are also experimenting with ultra-violet sterilisation. For small scale work the ultra-violet sterilisation is very well adapted, but ozone is better for large scale operations. The great advantage of both of these processes is that nothing is added to the water. With the ultra-violet rays it is a question of killing by means of light. With ozone the sole product remaining at the end of the operation is oxygen.

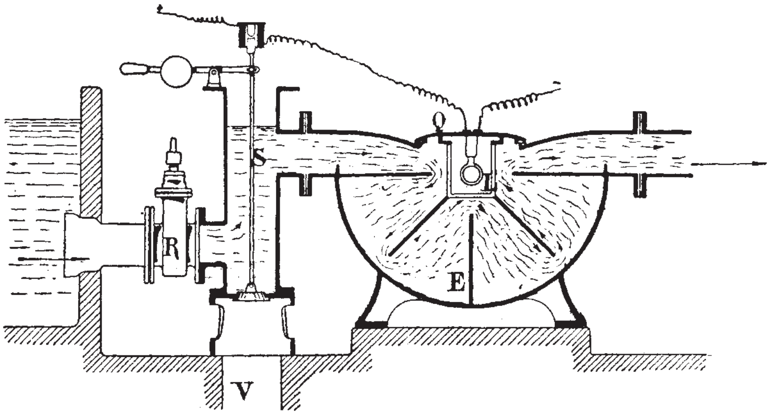

FIG. 5.

Ozone, or ozonised air, is most useful for ventilating purposes. The air of crowded rooms is dangerous to health from the large percentage of noxious organic impurities, many of them bacterial, which it contains. Ordinary ventilation, while minimising these, does not entirely do away with them. If, however, the fresh air driven into the room for ventilation be previously ozonised, the organic impurities become oxidised. Ozonised air is, as a matter of fact, very largely employed in the ventilation of theatres and other large public buildings. Complaint is continually made as to the evil effect of the atmosphere of the House of Commons upon the members of Parliament, and this, in spite of strenuous efforts on the part of ventilation engineers. Probably the atmosphere would be greatly improved if the ventilating shaft which supplies fresh air to the House had an ozonising apparatus placed in it. At the Turin Exhibition the beneficial effects of ozone were forcibly brought before the notice of the writer. Ozone plant is now being employed in the ventilation of the Tube Railways with beneficial results.

Ozone is used in the manufacture of vanillin from isoeugenol. It has also been found advantageous in brewing. Weak yeast appears to be strengthened by ozone and to act more vigorously if the air of the fermenting house is kept fresh with ozonised air. Ozone is used for bleaching oils and fats, the results being very striking. It is also used for blowing oils such as linseed oil. The bleaching effect of ozone has been found useful in laundries and for bleaching delicate fabrics. Flour is bleached by means of ozone. In this case, however, as a rule the apparatus is arranged to give at the same time small quantities of oxides of nitrogen. The flour is not only bleached but also sterilised. Unbleached rye meal which contained 2400 micro-organisms per gram before treatment contained 1600 per gram after treatment. In another case, unbleached wheat flour contained 540 organisms before treatment, and 170 after treatment.

The maturing effect of ozone on wines and spirits is remarkable. Spirit which requires years for ageing is matured in a remarkably short time by emulsifying with ozone. The use of ozone in tobacco factories to aid the maturing has also been suggested.

F. MOLLWO PERKIN.

MELANESIANS.[1]

SEVERAL books, mainly by missionaries, have been written on particular islands or groups of islands in Melanesia, but with the exception of Dr. Codrington's "The Melanesians: Studies in their Anthropology and Folk-lore" (1891), there has been no general book on Melanesia, and even Dr. Codrington says very

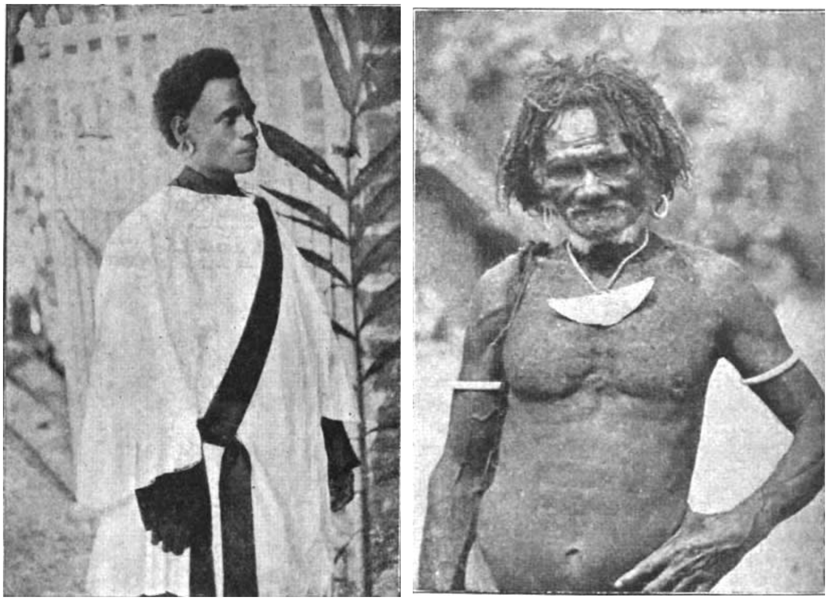

FIG. 1.—The Rev. John Pengoni and his father. From "Islands of Enchantment."

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[1] "Islands of Enchantment: Many-sided Melanesia." Seen through Many Eyes, and recorded by Florence Coombe. Pp. xxvii+382. (London: Macmillan and Co., Ltd., 1911.) 12s. net.

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little about the Solomon Islands. This lack of a general survey has been supplied by Miss Florence Coombe, who has written a most admirable and interesting account of her voyaging among these fascinating islands on board the *Southern Cross,* the steam-yacht which does the business of the Melanesian Mission in great waters. And it is not as tourists and strangers that her passengers go to and fro among the groups, but rather as "friends of the family," knowing somewhat of each island's story, and having familiar acquaintances among the brown folk everywhere, so that they are received and made welcome in the homes of the people.

It is obvious that Miss Coombe could not have collected first hand all the information contained in her book; indeed, on the title-page she describes her account as "seen through many eyes, and recorded" by herself. Her indebtedness to Codrington's classical work is manifest; her acknowledgments to certain other helpers are also mentioned; but, like all travellers, she must have gained a considerable amount of casual information from missionaries. All this, combined with that gained by her own keen powers of observation, she has weaved into a bright narrative that carries the reader along without a hitch. The personal element is unobtrusive but sufficient to give continuity and unity to the narrative, and when the reader has finished the book, which he assuredly will do when he once begins it, he will find himself in possession of a general impression of Melanesia and of a large amount of detailed knowledge which cannot be gained from any single source.

Though dealing with the sphere of influence of the Melanesian Mission, the missionary element is not obtruded, and where brought in merely serves to illustrate the ameliorating influences of the "'new teaching,' or 'the way of peace,' as Christianity is called by the Melanesians." The popular treatment should give the book a large sale; on the other hand, it is a book which the ethnologist must read, as it is crowded with facts and observations, some of which are new. The very numerous and beautiful photographs, by J. W. Beattie, not only embellish the book, but afford to the student a mine of ethnographical details. Various folk-tales are interspersed throughout the book; some inevitably record the prowess of Qat, the hero of the Banks Group, one or two of which are variants of those narrated by Codrington. An interesting account is given of a visit to the little-known island of Tikopia, and the author emphasises the contrast of the natives—a Polynesian outlier in Melanesia—with those of neighbouring islands.

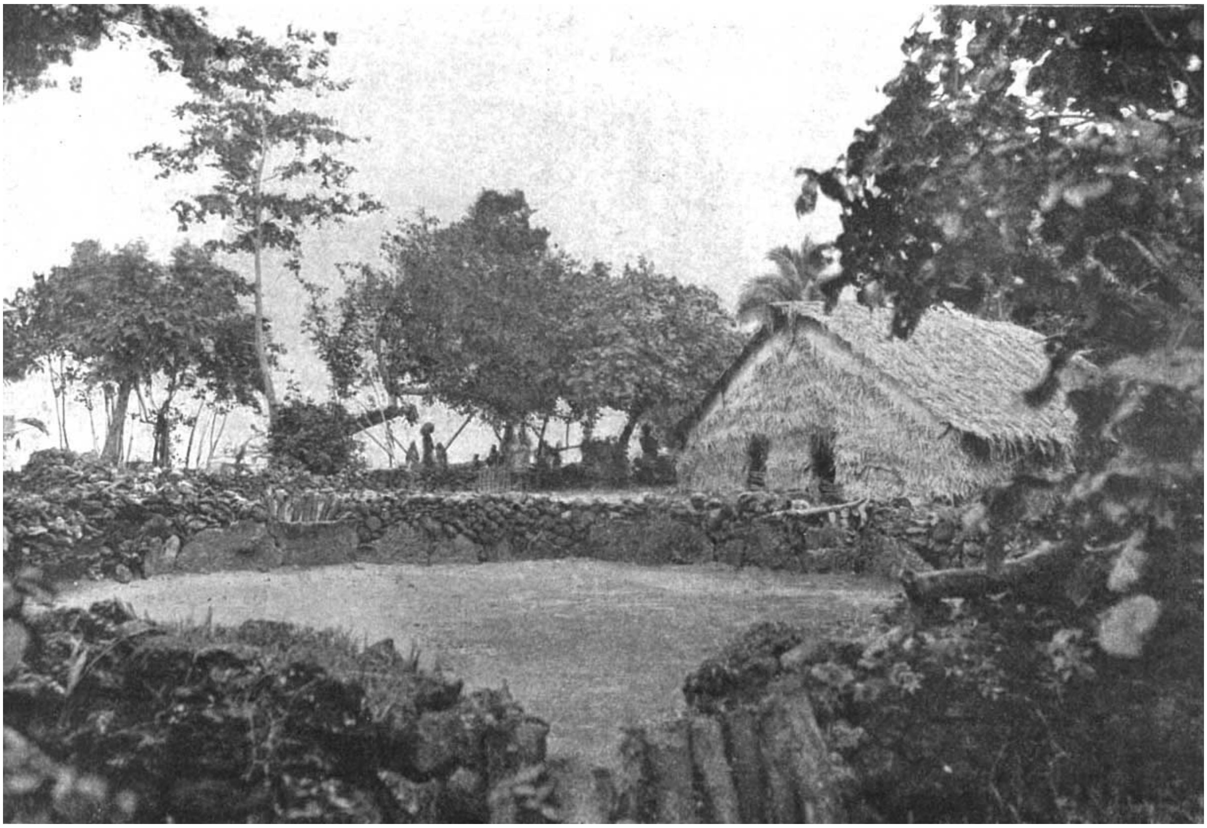

FIG. 2.—*Gamal* and dancing-grounds. From "Islands of Enchantment."

THE ETIOLOGY OF KALA-AZAR.

A TELEGRAM from Surgeon-General Bannerman to Sir Ronald Ross, published in *The Times* and other daily papers of February 15, announces that Captain W. S. Patton, I.M.S., "has discovered the complete development of the parasite of Kala-azar in Indian and European bed-bugs." The news, as it stands, is not quite intelligible, since Captain Patton proved in 1907 that the parasite *Leishmania donovani* went through the same development in the Indian bed-bug, *Cimex rotundatus*, that it had been discovered by Major Leonard Rogers to undergo in artificial cultures. On epidemiological grounds the

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